

100

Generate a dictionary of
Keywords

(110)

Form categories
using the dictionary and
automated Algorithm

(120)

Count occurrences of structured
variables, categories and
structured variable/category
combinations

(130)

Calculate probabilities of
occurrences of structured
variable/category
combinations

(140)

- Figure 1

FIGURE 2

```
for(int i=0; i<total; i++){
    SparseMatrixRow smr = t.getData(i);
    dictionIndex = smr.positions;
    cat=getCat(i, granularity);
    categoryPos = ((Integer)categoryHash.get(cat)).intValue();
    categoryCount[categoryPos] ++;
    for(int j=0; j<dictionIndex.length; j++){
        variablePos = dictionIndex[j];
        counter[variablePos][categoryPos] ++;
        variableCount[variablePos] ++;
    }
}
```

Accepted for publication

FIGURE 3

Example	Dictionary Term	Category	Count
16	requested	Install Request	1
16	reset	Lotus Notes	1
16	afs	AIX	1
16	password	VM	3
17	www	AFS	1
17	release	Refresh	1
18	adsm	ADSM	1
18	password	VM	4

FIGURE 4

```
Vector v = new Vector ( );

for(int i=0; i<variableSize; i++){
    for(int j=0; j<categorySize; j++){
        //if the expected number of combinations within a given cluster and data is less than the
        actual
        if((categoryCount[j] * variableCount [ i ])/total < counter [ i ] [ j ]){
            //do Chi function
            probability [ i ] [ j ] = ChiSquared.prob(total, categoryCount [ j ], variableCount [
i ], counter [ i ] [ j ]);
        }
        //if the expected number of combinations within a given cluster and date is more than the
        actual
        else{
            probability [ i ] [ j ] = 1.0;
        }
        if (probability [ i ] [ j ] < probabilityThresh && counter[ i ] [ j ] >
confidenceThresh){
            v.addElement(new EventMarker(variableName [ i ], category [ j ], probability [ i ] [
j ], variableCount [ i ],
            )
        }
    }
}
```

Accepted Manuscript

060327JES 044901

	Keywords	Category	Probability	Keyword Count	Category Count	Keyword-Cate
62	confirmand	AIX	0.0000	178	452	102
63	wordpro	Smartsuite (L...	0.0000	22	50	11
64	customized	Printing	0.0000	125	955	125
65	page	Refresh	0.0000	228	31	28
66	unable	Printing	0.0000	334	955	228
67	install-customiz...	Printing	0.0000	122	955	122
68	autoproxy	Netscape	0.0000	15	77	11
69	password-dce	AFS	0.0000	52	266	39
70	connect-network	Networking	0.0000	64	299	46
71	jobs	Printing	0.0000	121	955	119
72	reset-adsm	ADSM	0.0000	9	94	9
73	connect	Networking	0.0000	262	299	98
74	page-dce	AFS	0.0000	34	266	30
75	rebuilt	Install Request	0.0000	19	109	14
76	p340ua	Printing	0.0000	113	955	111
77	ign	Remote Access	0.0000	40	61	15
78	smart	Smartsuite (L...	0.0000	11	50	7
79	print-successfully	Printing	0.0000	104	955	104
80	password-afs	AFS	0.0000	46	266	34
81	softdist	AIX	0.0000	53	452	48
82	web-page	AFS	0.0000	102	266	52

Jan 5

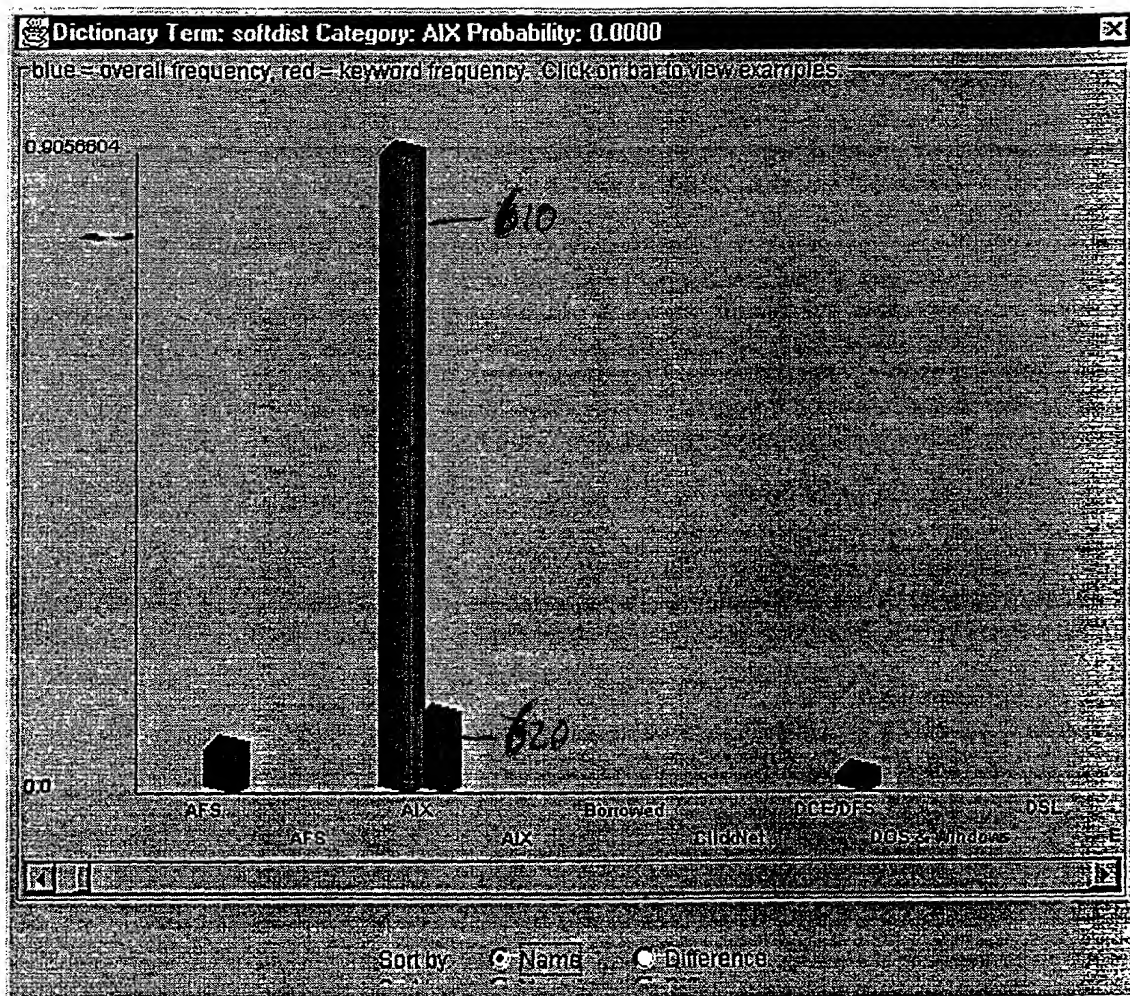


Figure 6

Search Result

Example 6 (#245): AIX installation The user wanted AIX version 4 3 1 installed on his workstation I installed AIX version 4 3 1 off the SoftDist server Friday at 5:00 PM

Find 7

Discover

☒ Data Groups ☐ Class Discovery ☐ Dictionary Term Discovery

Time Granularity ☒ Monthly ☐ Weekly ☐ Daily

Probability threshold ☒ 0.5 ☐ 0.1 ☐ 0.01

Confidence threshold ☒ 25 ☐ 5 ☐ 10

start cancel

Figure 8.

[illegible]

```

for(int i=0; i<total; i++){
    if (discovery.equals("class")){
        variablePos = t.membership[i];
        variableCount[variablePos] ++;
        cat = getCat(i, granularity);
        categoryPos = ((Integer)categoryHash.get(cat)).intValue();
        counter[variablePos][categoryPos] ++;
        categoryCount[categoryPos] ++;
    }
    if (discover.equals("dictionary")){
        SparseMatrixRow smr = t.getData(i);
        dictionIndex = smr.positions;
        cat = getCat (i, granularity);
        categoryPos = ((Integer)categoryHash.get(cat)).intValue();
        categoryCount[categoryPos] ++;

        for(int j=0; j <dictionIndex.length; j++){
            variablePos = dictionIndex[j];
            counter[variablePos][categoryPos] ++;
            variableCount[variablePos] ++;
        }
    }
}

```



```
public class EventMarker{

    String variable = null;
    Object category = null;
    double probability = 0;
    int totalVariable;
    int totalCat;
    int total;

    public EventMarker(String variableID, Object categoryID, double probID, int
totalVariableID, int totalCatID, int total_____

        variable = variableID;
        category = categoryID;
        probability = probID;
        totalVariable = totalVariableID;
        totalCat = totalCatID;
        total = totalID;
    }
}
```

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21

	Keywords	Date	Probability	Keyword Count	Date Count	Keyword+Date
1	newtext	Feb 1998	0.0000	38	557	37
2	visiblesolution	Feb 1998	0.0000	38	557	37
3	solution	Feb 1998	0.0000	64	557	37
4	project	Jun 1998	0.0000	30	674	23
5	pay	Mar 1998	0.0000	21	738	18
6	refresh	Jun 1998	0.0000	65	674	30
7	callup	Mar 1998	0.0000	56	738	28
8	elimination	Jul 1998	0.0000	24	586	15
9	bringing	Jun 1998	0.0000	15	674	12
10	chapelaine	Jun 1998	0.0000	11	674	10
11	hernandez	Dec 1998	0.0000	20	358	10
12	setpasswd	Jan 1998	0.0000	36	471	16
13	named	Jan 1998	0.0000	36	471	16
14	netdoor	Jun 1998	0.0000	90	674	34
15	arcprt02	Jul 1998	0.0000	51	586	22
16	d03nm041	May 1998	0.0000	81	483	26
17	p3116h2a	Oct 1998	0.0000	20	534	12
18	arcprt03	Sep 1998	0.0000	20	455	11
19	base	Mar 1998	0.0000	33	738	19
20	rebecca	Dec 1998	0.0000	66	358	19
41	rebecca	Dec 1998	0.0000	66	358	19

Figure 14

0903150 041004
T0540 8460

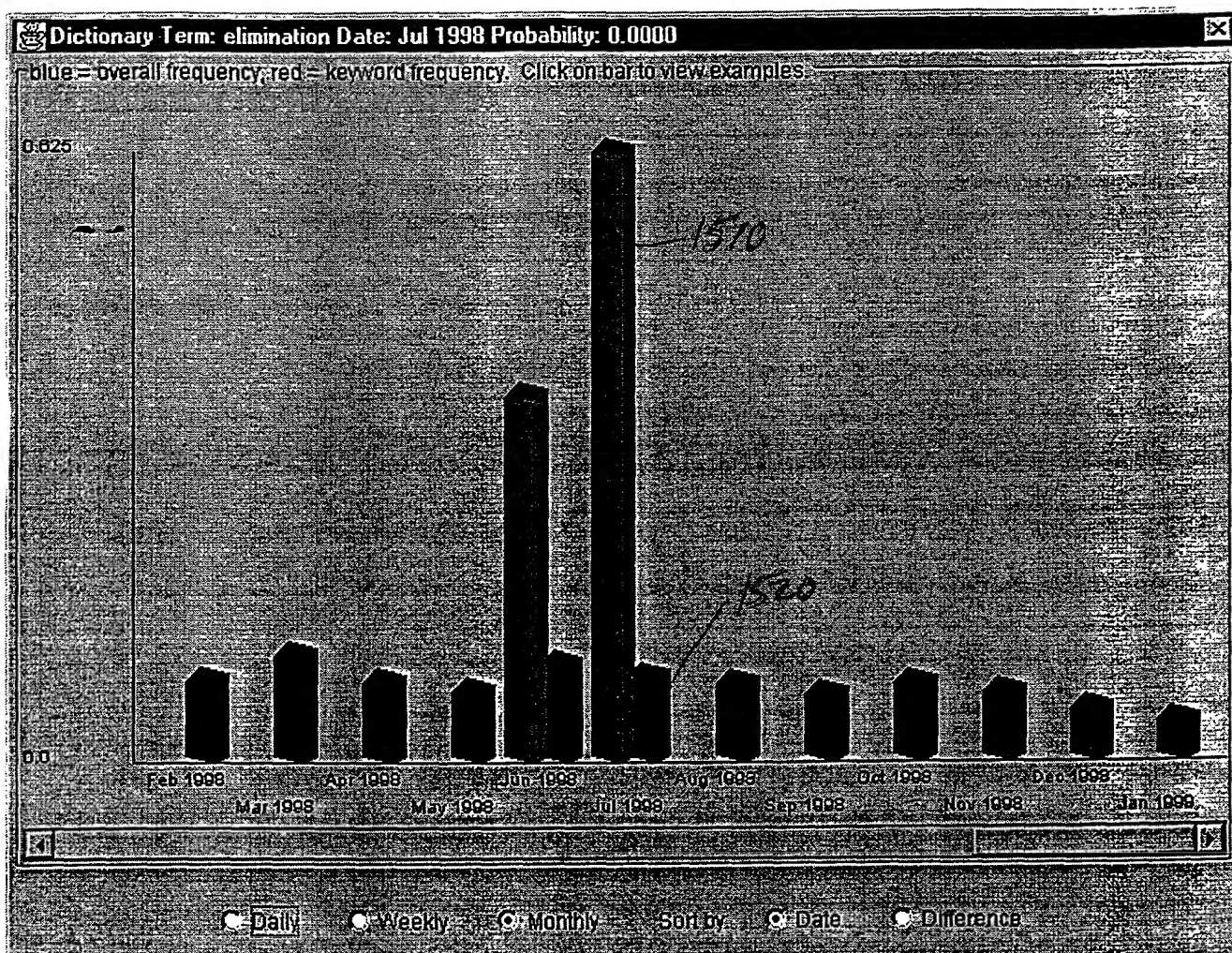


Figure 15

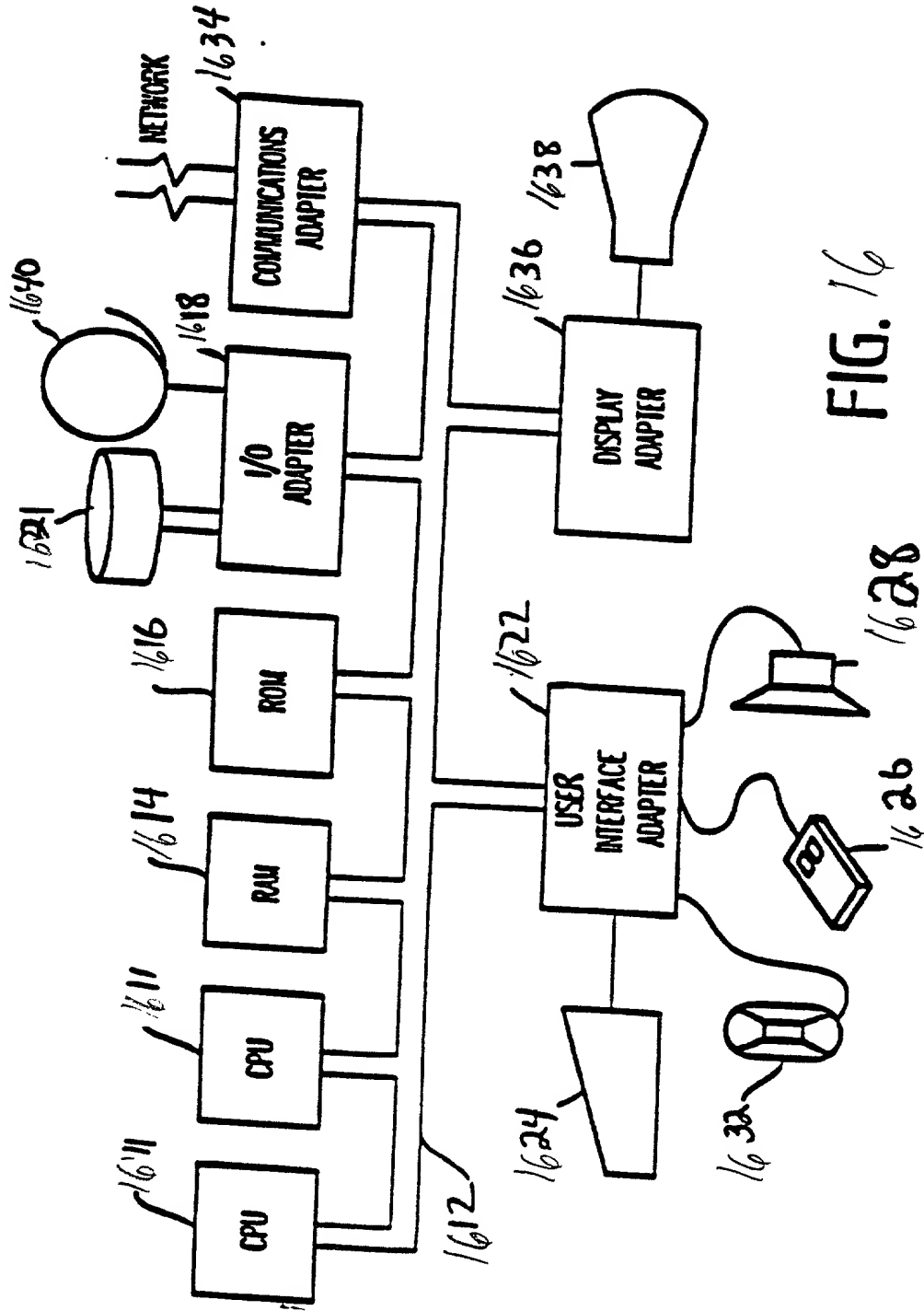


FIG. 16

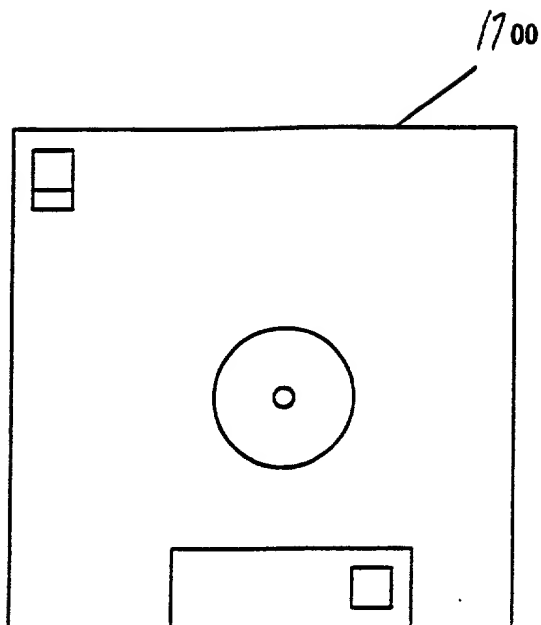


FIGURE 17